

Message

From: SWMM-USERS [SWMM-USERS@LISTSERV.UOGUELPH.CA]
on behalf of Keith Hume [keith.hume@SNO.CO.ORG]
Sent: 6/22/2020 4:21:18 PM
To: SWMM-USERS@LISTSERV.UOGUELPH.CA
Subject: [SWMM-USERS] Flow frequency percentage

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To follow up to Bob's response, two useful and free text file comparison tools available on the internet are Notepad++ (requires adding comparison tool plug-in) and WinMerge.

From: SWMM-USERS On Behalf Of Gouri Kadam
Sent: Sunday, June 21, 2020 11:11 AM [UTC]
Subject: Flow frequency percentage

Hello Robert,

Thank you for the prompt help. Your suggestions and observations are really helping us in model improvement.

From: SWMM-USERS On Behalf Of Robert Dickinson
Sent: Sunday, June 21, 2020 10:47 AM [UTC]
Subject: Flow frequency percentage

Hello Gouri,

For the sake of others in the future (assuming they read these threads) I have the following comments on your two models. Thanks, for sending them to me.

1. You were using a 3rd party tool to create your input file - in this case, iinpINS,
2. You cannot rely on the Status Report only to debug your model output, you need to use a file comparison program to compare the two text files,
3. I noticed right away that in your less flooding model you have max node depths of 5 meters and in your more flooding model you had max depths of 0.5 to 1.0 so you made your model better,
4. However, a large max depth means less flooding as there is now 4 meters of extra HGL and storage,
5. The Manning's n of your links increased from 0.01 to 0.012 which also may cause a bit more flooding,
6. All of your nodes now have an initial depth which creates initial storage and also alters the timing of the flooding,
7. In all cases, you are improving your model by adding better elevation and depth data but it is NOT the same model. The model data is close but there are significant differences.

You need to look at the generated input files to make sure they are the same and that you understand the differences.

Regards,
Robert Dickinson
Innovyze Inc.

From: SWMM-USERS On Behalf Of Gouri Kadam
Sent: Friday, June 19, 2020 05:16 PM [UTC]
Subject: Flow frequency percentage

Hi Robert,

Following are few more details
have turned off ponding allowed? -> No its same for both runs.
The runoff has increased a tiny amount in the 2nd run now -> as I removed
warning 02 in this run

Two more differences I wanted to highlight that

1. Flow routing continuity Error (%) 2.317 for second run
Continuity Error (%) -2.699 for first run

2. Flow balance % error is more in the second run

For the simulation of heavy flood event, in the 2nd run, assumed that all drains have initial flow = 25% of the drain capacity
whether his assumption is causing error in flow balance..

From: SWMM-USERS On Behalf Of Robert Dickinson
Sent: Wednesday, June 17, 2020 03:29 PM [UTC]
Subject: Flow frequency percentage

Yes, your rainfall is the same. The runoff has increased a tiny amount in the 2nd run now. As you say the flooding is drastically different in the 2nd run compared to the 1st run. I notice your initial storage is high in the 2nd run. Sans, the actual model it looks like you are now using a hot start file (the cause of the initial storage possibly) and have turned off ponding allowed? If you are using the Native SWMM GUI you might be able to debug this yourself using the System graphs for Runoff, Storage, Outflow, and Flooding in both of your runs.

From: SWMM-USERS On Behalf Of Gouri Kadam
Sent: Wednesday, June 17, 2020 02:23 PM [UTC]
Subject: Flow frequency percentage

Thank you for the reply.
I have modified slope, roughness ,initial depth and invert elevation in the second run. Rainfall was the same. From the status report I found in the 2nd run flooding loss has been increased drastically. This might be reason of decrease in total outfall . But I could not find the reason of decrease in flow frequency of only outfall 12 as compare to others. Please guide regarding this.

BEFORE CHANGE

Analysis Options

Flow Units CMS

Process Models:

Rainfall/Runoff YES

RDII NO

Snowmelt NO

Groundwater NO

Flow Routing YES

Ponding Allowed NO

Water Quality NO

Infiltration Method HORTON

Flow Routing Method DYNWAVE

Surcharge Method EXTRAN

Starting Date 09/23/2019 19:00:00

Ending Date 09/25/2019 09:00:00

Antecedent Dry Days 0.0

Report Time Step 01:00:00

Wet Time Step 00:05:00

Dry Time Step 01:00:00

Routing Time Step 30.00 sec

Variable Time Step YES

Maximum Trials 8

Number of Threads 1

Head Tolerance 0.001500 m

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	109.670	166.000
Evaporation Loss	0.000	0.000
Infiltration Loss	2.818	4.265
Surface Runoff	105.524	159.724
Final Storage	1.366	2.068
Continuity Error (%)	-0.035	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	105.514	1055.153
Groundwater Inflow	0.000	0.000

RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	101.669	1016.702
Flooding Loss	6.605	66.050
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	0.000	0.000
Final Stored Volume	0.088	0.876
Continuity Error (%)	-2.699	

AFTER CHANGE

Analysis Options

Flow Units CMS
 Process Models:
 Rainfall/Runoff YES
 RDII NO
 Snowmelt NO
 Groundwater NO
 Flow Routing YES
 Ponding Allowed NO
 Water Quality NO
 Infiltration Method HORTON
 Flow Routing Method DYNWAVE
 Surcharge Method EXTRAN
 Starting Date 09/23/2019 19:00:00
 Ending Date 09/25/2019 09:00:00
 Antecedent Dry Days 0.0
 Report Time Step 00:15:00
 Wet Time Step 00:05:00
 Dry Time Step 01:00:00
 Routing Time Step 30.00 sec
 Variable Time Step YES
 Maximum Trials 8
 Number of Threads 1
 Head Tolerance 0.001500 m

*****	Volume	Depth
Runoff Quantity Continuity	hectare-m	mm
*****	-----	-----
Total Precipitation	109.670	166.000
Evaporation Loss	0.000	0.000
Infiltration Loss	2.537	3.840
Surface Runoff	106.879	161.776
Final Storage	0.306	0.463
Continuity Error (%)	-0.048	

*****	Volume	Volume
Flow Routing Continuity	hectare-m	10^6 ltr
*****	-----	-----
Dry Weather Inflow	0.000	0.000
Wet Weather Inflow	106.876	1068.766
Groundwater Inflow	0.000	0.000
RDII Inflow	0.000	0.000
External Inflow	0.000	0.000
External Outflow	12.610	126.106
Flooding Loss	94.300	943.014
Evaporation Loss	0.000	0.000
Exfiltration Loss	0.000	0.000
Initial Stored Volume	2.936	29.356
Final Stored Volume	0.356	3.559
Continuity Error (%)	2.317	

 From: SWMM-USERS On Behalf Of Robert Dickinson
 Sent: Tuesday, June 16, 2020 02:52 PM [UTC]
 Subject: Flow frequency percentage

Your total outfall in your 2nd table is less than 10 percent of the outfall flow in the 1st table. If your parameters are the same then the most likely problem is your rainfall. How has your total rainfall changed from the 1st run to the 2nd run?

From: SWMM-USERS On Behalf Of Gouri Kadam
Sent: Tuesday, June 16, 2020 01:47 PM [UTC]
Subject: Flow frequency percentage

I got two values of flow frequency percentage of outfall with changes in initial condition, not able to find out the reason of this change.

outfall 12 shows drastic difference in change in flow frq. %. Can anybody please help where I went wrong, what could be the reason of this. I checked all parameters of conduit, subcatchment and nodes

BEFORE CHANGE

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
5	99.89	0.734	3.868	66.355
12	99.89	0.178	1.259	16.107
155	99.78	2.292	16.402	205.007
97	99.89	7.900	43.083	729.229
System	99.86	11.104	43.083	1016.697

AFTER CHANGE

Outfall Node	Flow Freq Pcnt	Avg Flow CMS	Max Flow CMS	Total Volume 10^6 ltr
5	100.00	0.301	1.384	29.935
12	0.44	0.079	0.747	0.059
97	100.00	0.303	3.705	29.238
155	100.00	0.216	2.700	20.240
System	75.11	0.898	2.700	79.472

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